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Service orientation in business networking: a demand-supply chain perspective

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ABSTRACT

Competition in globalized markets is nowadays between business networks (BNs) rather than between single organizations. BNs need to co-create highly customized integrated solutions for customers through dynamic collaborations within value networks to achieve competitive advantages in globalized markets. Although different theories in marketing and operations management have been developed to address the necessity for service orientation through co-creating mass-customized integrated solutions, a comprehensive and coherent view on the characteristics of a service-oriented business network (SBN) has not yet received sufficient attention. In this article, we intend to present and discuss an integrated framework that brings together different service orientation related theories and describes them in a structured way. The applicability and usefulness of the developed framework for directing service orientation in real-life BNs is evaluated on the basis of a multiple-case study research. The article bridges the gap between descriptive knowledge on service orientation and prescriptive engineering models for designing and implementing SBNs.

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Service orientation; business networking; demand chain; supply chain; integrated solution

1. Introduction

Competition in globalized markets forces organizations to focus on their core competencies and outsource other activities (Kothandaraman and Wilson 2001; Ritter, Wilkinson, and Johnston 2004). This highlights the importance of business networking to achieve competitive advantage in globalized markets (Gereffi, Humphrey, and Sturgeon 2005). Business networking can be defined as the organization and management of IT-enabled business relationships with internal and external business partners (Alt, Fleisch, and Österle 2000). Partners collaborating within a business network (BN) can be 'mainly autonomous, globally distributed, and heterogeneous in terms of their operating environment, culture, social capital and goals, but, they collaborate to (better) achieve common or compatible goals' (Camarinha-Matos et al. 2009). In globalized markets, the competition is between BNs rather than between single organizations (Zhang 2006).

Meanwhile, the empowerment of customers in globalized markets shifts the locus of BNs from producers and retailers to buyers and users (Christopher and Ryals 2014). Information-enabled customers, who are globally connected within customer communities supported by social media technologies, have forced BNs to put more emphasis on improving customers' experiences (Aral, Dellarocas, and Godes 2013). In addition, deeper collaboration among parties within networked e-business structures enables BNs for collaborative innovation and design of new products and services (Emden, Calantone, and Droge 2006; Romero and Molina, 2011). Business intelligence in the light of 'big data' technologies shortens time to market and enables greater specificity of value proposed to customers (Chen, Chiang, and Storey 2012). In this environment, BNs require co-creating mass customized integrated solutions with customers through deeper interactions within value networks in order to rapidly respond to sensed market opportunities (Pine 1999; Gaiardelli, Martinez, and Cavalieri 2015). This situation highlights service orientation in BNs as an essential necessity to survive in current global business environments (Gebauer 2008; Jacob and Ulaga 2008; Christopher and Ryals 2014). The concept of service orientation refers to richer interactions with customers to enhance the value for these customers of the use of provided products and services. The richness of interactions is increased by finer-grained interactions, more real-time interactions and interactions that are more customized to the precise context of a customer.

A service-oriented business network (SBN) can be described as a collaborative network of independent parties that together offer a mass customized products and services in the form of an integrated solution through the co-creation of value with customers (Storbacka et al. 2013; Rasouli et al. 2014). The co-creation of an integrated solution has been addressed by emerging theories in the context of marketing (Vargo and Lusch 2004), operations management (Roy et al. 2009; Gebauer 2008; Meier, Roy, and Seliger 2010; Neely 2007; Cavalieri and Pezzotta 2012) and information systems (Goldman et al. 1995; Sambamurthy, Bharadwaj, and Grover 2003; Grefen et al. 2009). These theories have been used in recent research to develop service-oriented businesses

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(Kindström 2010; Storbacka 2011; Lüftenegger 2014). However, many of these studies rely on service orientation within a single organization and a comprehensive view on service orientation in the context of BNs has not been given sufficient attention. More precisely, service orientation has mostly been addressed from the point of view a single organization and networking aspects of service orientation such as cross-organizational interactions or network governance for service orientation have not been explicitly addressed (Löfberg, Witell, and Gustafsson 2015). In this article, we explicitly address the network point of view. Meanwhile, related research in the context of BNs has generally focused on specified set of activities within a whole value chain such as new service development (Spring and Araujo 2013; Eisingerich, Rubera, and Seifert 2009), operations and logistics management (Lockett et al. 2011; Durugbo and Riedel 2013), value proposition (Mencarelli and Rivière 2015), added value service supply chains (He et al. 2016) or networked value creation (Jaakkola and Hakanen 2013). However, a comprehensive view comprising all activities within a value chain to support service orientation in BNs is lacking. The lack of a comprehensive view on the different aspects of service orientation in BNs can result in the misalignment between different network strategies as well as the misalignment between parties involved within the different activities in a whole value chain in a BN. For example, regarding the cases that have been studied within this research, due to the lack of a comprehensive view on service orientation, parties who directly contact with final customers follow strategic objectives that are not supported by parties who are involved within the supply and procurement activities.

Regarding the description of an SBN in the previous paragraph, in this research, we intend to '*comprehensively and coherently describe a BN who is aiming to co-create integrated solutions with customers*'. The comprehensiveness points out a thorough view on different theories that underline service orientation within different activities of a whole value chain in a BN. The coherence refers to the investigation of service orientation in BNs from different relevant aspects in a structured way. This comprehensive and coherent characterization contributes to knowledge in the context of BNs by providing a well-established basis that brings together different service orientation theories such as service-dominant logic and servitization theories. It also bridges the gap between the descriptive theories on service orientation and prescriptive approaches for designing networked business models (e.g. see Lüftenegger 2014). From a practical point of view, this characterization provides a well-structured insight for decision makers in BNs to analyze their situation regarding service orientation and also to investigate their service orientation transition. The coherence of this characterization can enhance the alignment of different service orientation decisions.

To do so, we characterize service orientation in BNs within an integrated framework. This integrated framework considers the different dimension of service orientation from the different relevant aspect. In doing so, a design science research approach is conducted that relies on two phases, respectively, the construction phase and the evaluation phase (Peffers et al. 2007; von Alan et al. 2004). Within the construction phase, a cybernetic system view (Von Bertalanffy 1956) is used for the exploration of different aspects of a BN, respectively, the output, the interactions and the governance aspects (which supports coherence of the developed integrated framework). For the characterization of service orientation within each of these aspects, a distinction between a supply chain and a demand chain dimension in a value chain is considered (Hilletofth 2011). This results in an integrated framework in the form of the three two-dimensional matrices that characterizes an SBN. The applicability and usefulness of this integrated framework for the characterization of service orientation in real-world BNs are evaluated through a multiple case study research.

In the next section, the approach for the development of the integrated framework for the characterization of service orientation in BNs is elaborated. The developed integrated framework is represented in Section 3. Section 4 reflects a case study research approach for the evaluation of the developed framework. The findings of this case study research are elaborated in Section 5. The article is concluded by a discussion of contributions, implications and future steps in Section 6. This article has been adapted from the PhD research that has been conducted in the context of SBNs (see Rasouli 2016).

2. Approach used to develop the integrated framework

In order to develop an integrated framework that coherently and comprehensively characterizes an SBN, two main foundations are used in this article. The first foundation addresses the use of a cybernetic system view (Von Bertalanffy 1956) on a phenomenon, which enables us to have a coherent view on different aspects of a BN and investigate service orientation within these different aspects in an integrated way. More precisely, due to inter-relationships among the aspects proposed by a cybernetic system view, this foundation addresses integration within service orientation transition through a coherent view on different related aspects. This integration highlights how supportive mechanisms and governance routines can be aligned to support desired service-oriented value that is going to be proposed by a BN. The second foundation highlights the distinction between a supply chain and a demand chain dimensions within a value chain which supports the comprehensive characterization of different relevant service orientation theories, such as new service development, service-oriented operations, and service-oriented marketing in the context of BNs. In this way, the first foundation results in three different aspects that need to be taken into consideration in order to investigate an SBN coherently. The second foundation addresses two different dimensions of service orientation that can be taken into consideration within each aspect of a BN to have a thorough view on different relevant theories. These two foundations are described further in this section.

2.1. Three inter-related aspects of BNs based on a cybernetic system view

System engineering approaches provide a well-established basis to analyze complex phenomena in a structured way (Von Bertalanffy 1956). With respect to the complex nature of BNs (Borgatti and Foster 2003), system engineering approaches can provide a relevant analytical basis. These approaches are basically established upon the recognition of different aspects in order to separate various concerns regarding a system. In this research, we rely on the aspects suggested by the cybernetic system engineering approach (Marca and McGowan 1987). The logic behind the aspects suggested by the cybernetic system engineering method helps us to establish a coherent view on different aspects of a BN. In addition, the cybernetic system approach has been used before in production and supply chain contexts and hence can be considered a well-usable foundation (Fischer and Rehm, 2004; Stich and Blum, 2015).

The cybernetic system approach distinguishes between the four main aspects of a system including input, output, supportive mechanism and control (Marca and McGowan 1987). Based on these four main aspects, we need to determine the concrete aspects to explore a BN. This refinement determines aspects that are critically important in the context of BNs. The inputs of a BN are interacting parties who follow a joint objective (Borgatti and Foster 2003; Camarinha-Matos and Afsarmanesh 2005). Because, in this research, we intend to explore the characteristics of a BN and not organizations forming it, we do not take into consideration the input aspect of this research. The output of a BN is value that is produced and co-created for customers (Grönroos 2011). Regarding the fact that a BN is established upon interactions between interdependent parties (Provan, Fish, and Sydow 2007), we focus on networked interactions as a critical supportive mechanism.

In line with previous research (Jones, Hesterly, and Borgatti 1997; Zaheer and Venkatraman 1995), we reflect the control aspect of a BN by the notion of 'network governance'. The network governance involves formal and informal bindings to adopt a network to environmental changes and to coordinate and safeguard interactions between parties (Jones, Hesterly, and Borgatti 1997). According to the previous aspect, within the network governance aspect, we concentrate on governing networked interactions in SBNs. In this way, we do not address governance issues within the boundaries of a single organization. The three concrete aspects that are used to explore BNs, in this article, is represented in Figure 1.

2.2. Demand chain and supply chain dimensions within value chains

For the exploration of service orientation within each of the described aspects of a BN, we distinguish between two dimensions of the value chain, respectively the demand chain and the supply chain dimension. The distinction between these two different dimensions within a BN has been clearly demonstrated in previous research (Jüttner, Christopher, and Godsell 2010; Hilletofth 2011; Christopher and Ryals 2014). Based on the value chain framework (Porter 2008), the demand chain dimension of the value chain embraces the marketing, sales and customer relationship management activities. These activities respond to the need for understanding, creating and simulating of customers' demand (Hilletofth, Ericsson, and Christopher 2009). These activities can be reflected by the 'value creation' notion in the marketing context (Grönroos 2011). The supply chain dimension, on the other hand, includes inbound logistics, operations and outbound logistics activities and aims to fulfil the customer demand (Jüttner, Christopher, and Godsell 2010). These activities that aim to fulfil demand (Christopher and Ryals 2014) can be reflected by the 'value production' notion (Svensson and Grönroos 2008). Although the integration of these two dimensions within a BN is a crucial task (Jüttner, Christopher, and Godsell 2010), many argue that it is inevitable to concentrate strategic focus on one of these two dimensions (Hilletofth, Ericsson, and Christopher 2009). Therefore, a BN needs to balance between these two dimensions within its service orientation transition. Service orientation within each of these two dimensions is elaborated in the next section.

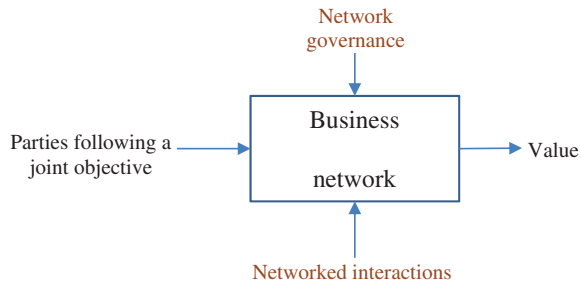

Figure 1. The cybernetic system based representation of the BN aspects.

3. The development of the integrated framework to characterize service orientation in BNs

Based on the described approach, we develop an integrated framework in the form of three two-dimensional matrices. These three matrices together are called the integrated framework because they coherently describe different interrelated relevant aspect of SBNs. The matrices are described respectively in the following of this section.

3.1. Value aspect of service orientation in BNs

The concept of 'value' is elusive and is conceptualized in different ways in the literature (Woodall 2003). According to the described dimensions within value chains, we distinguish between a demand chain and a supply chain perspective on 'value'. This distinction has been considered in the related literature in the context of marketing and operations management (e.g. see Cova, Dalli, and Zwick 2011; Grönroos and Voima 2013; Humphreys and Grayson 2008) in the context of marketing and (Christopher and Ryals 2014; Hilletofth, Ericsson, and Christopher 2009; Jüttner,

Christopher, and Godsell 2010) in the context of supply chain management).

A demand chain perspective on value, which concentrates on customer related processes, relies on the creation of value (Grönroos 2011). Value creation can be defined as 'process through which the customer becomes better off in some respect' (Svensson and Grönroos 2008). On the other hand, the supply chain perspective, which focuses on supply-related processes, reflects the 'production' of value. The value production highlights all activities required to design, manufacture and deliver a product or service. The value production addresses the fulfilment of products and services that are proposed to customers (Christopher and Ryals 2014). In this way, value creation can be seen as a marketing function, where value production is a supply chain function (Christopher and Ryals 2014; Svensson and Grönroos 2008).

A BN should support activities relating to both aforementioned dimensions. A BN should produce a product or service and co-create value for customers during the usage of a product or service. However, regarding related theories in marketing and operations management contexts, service orientation within each of dimensions (i.e. value creation and value production) reflects different service orientation transitions. The distinction between service orientation within the value creation and the value production dimensions has also been addressed in previous research that investigates different service transitions (e.g. see Gaiardelli et al. 2014; Kowalkowski 2010; Leseure et al. 2010). Based on this distinction, we elaborate service-oriented value within the two dimensions separately (see Figure 2).

Service orientation within the value creation dimension addresses the service-dominant (S-D) logic of marketing (Vargo and Lusch 2004) and focuses on the creation of the value by customers. The S-D logic states that value always is determined by a customer in the form of the value-in-use. The concept of value-in-use demonstrates that value is created by a customer during the usage of a service or product (Grönroos and Voima 2013). This is contrary to the good-dominant (G-D) logic of marketing that views value from the supplier perspective as an economic benefit that is gained from a product or service fulfilled (i.e. value-in-exchange).

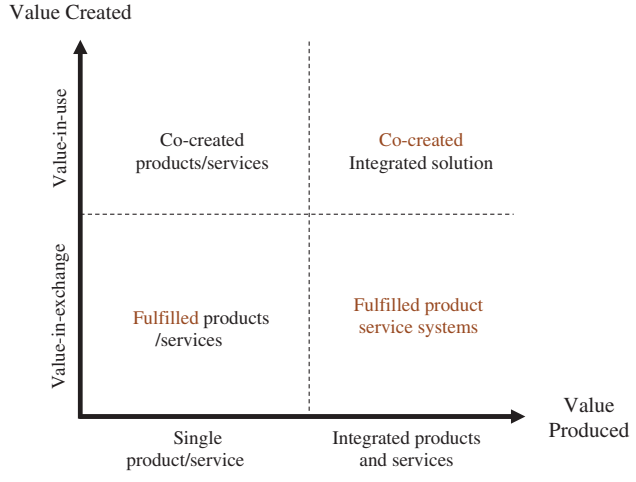

Figure 2. The characterization of the value aspect in SBNs.

Hence, it can be concluded that service orientation within the value creation dimension leads to the shift from a supplier-centric view on value (i.e. value-in-exchange) to a customer-centric view (i.e. value-in-use), see Figure 2, the value created axis. On the basis of Christopher and Ryals (2014), service orientation in this direction is in line with the shift from focusing on the fulfilment of a product or service (e.g. through conventional supply chain processes) towards concentrating on co-creating value (e.g. through deep understanding of desired value by a customer during its usage). According to the S-D logic, which indicates that the value is created by the customer, this shift stresses that the role of a supplier is the facilitation of the usage of a product or service by a customer and not only its delivery. In this way, the S-D logic highlights customer–supplier interactions during the usage of a product or a service that is reflected by the value co-creation concept.

Service orientation within the value production dimension points out the shift from the fulfilment of a product (or service) to the fulfilment of its utility (Mont 2002). In this way, service orientation in this direction stresses the servitization (Vandermerwe and Rada 1988; Roy et al. 2009) and the product service system (PSS) theories (Tukker and Tischner 2006) that indicate providing 'marketable set of products and services capable of jointly fulfilling a user's need' (Goedkoop 1999; Roy et al. 2009). This dimension of service orientation is motivated by the need to cope with changing market forces and the recognition that services in combination with products could provide higher profits than products alone (Mont 2002). Service orientation within this dimension can be realized by two main directions:

1. Time-based extension of provider responsibility: from product/service delivery towards product lifecycle management (PLM); This direction of service orientation in the context of BNs is mainly considered by forming service ecosystems that are able to support
2. Risk-based extension of provider responsibility: from output oriented towards result oriented responsibility.

This dimension of service orientation is established upon the development of supply chain capabilities (e.g. new product and service innovation, agile manufacturing, and maintenance) to provide more integrated package of products and services that enhance their utilization for customers. Hence, this dimension of service orientation leads BNs to fulfil integrated products and services, see Figure 2, the value produced axis.

The combination of the two described dimensions of service orientation within the value aspect can be addressed by the integrated solution notion. The notion of the integrated solution characterizes a situation that a value in the form of integrated products and services is created by a customer (Brady, Davies, and Gann 2005; Gummesson et al. 2012). The provision of integrated solutions requires the interaction between customers and suppliers in all activities within value chains, encompassing supply chain and demand chain activities.

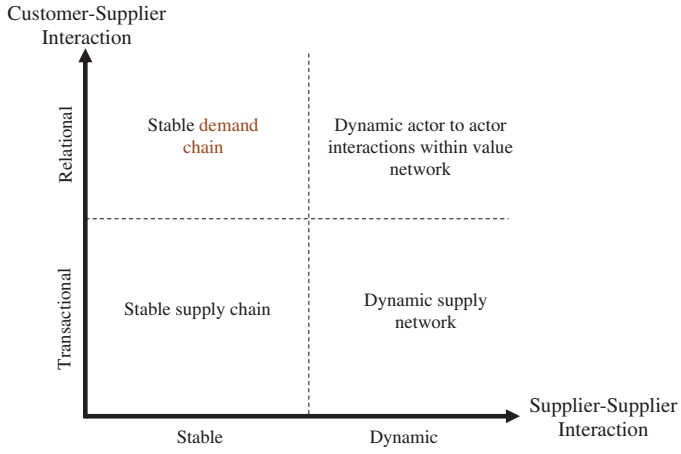

Figure 3. The characterization of the networked interactions aspect in SBNs.

3.2. The networked interaction aspect of service orientation in BNs

The core mechanism supporting a BN is networked interactions between collaborating parties (Provan, Fish, and Sydow 2007). According to the value aspect, we distinguish networked interactions in a BN within a demand chain and a supply chain dimension. The demand chain dimension focuses on customer–supplier interactions in a BN. The supply chain dimension, on the other hand, focuses at supplier–-supplier interactions, see Figure 3. The former can be seen as interactions between business parties within a value network with customer communities (Romero and Molina 2011). The latter refers to networked interactions among collaborating parties (Mehandjiev and Grefen 2010).

Service orientation within the demand chain dimension, in line with the S-D logic of marketing, relies on the shift from transactional customer–supplier interactions towards relational interactions (Ballantyne and Varey 2006); see Figure 3, vertical axis. Transactional interactions as a predominant logic of marketing are product oriented and can be seen as trying to get a customer fitted to a product. The transactional paradigm of marketing is based on the aim to attract a customer to buy a product. But, relational customer–supplier interactions that are considered as a basis for the service logic in the context of marketing can be seen as ongoing processes supporting the creation of perceived value for a customer (Grönroos 1997; Ballantyne and Varey 2006). The relational view, instead of trying to fit a customer to a pre-determined product or service, aims to provide better experience for a customer during the usage of a product or service. In this way, relational interactions mostly focus on value co-creation processes that facilitate the mutual contact between suppliers and customers (Prahalad and Ramaswamy 2004; Payne, Storbacka, and Frow 2008). The concentration on the fulfilment of value that is created by customer shifts BNs from product-oriented supply chains towards value-cantered demand chains (Christopher and Ryals 2014; Heikkilä 2002), see Figure 3, the customer–supplier interaction dimension. A value-centred demand chain is organized to deeply understand a desired value by customers (through value co-creation processes) and fulfil a co-created value by the orchestration of capabilities distributed among collaborating parties in a BN. According to Figure 2, supplier–supplier networked interactions in the context of SBNs should support the provision of integrated products and services. The provision of integrated products and services requires the enrichment of a BN (Gebauer, Paiola, and Saccani 2013; Storbacka et al. 2013). This enrichment results from the need for new products and services as well as the need for the full support of a product or service during its life-cycle. On the basis of the core competency theory (Prahalad and Hamel 1990), the enrichment of a BN can be realized by adding new parties with diversified competencies. However, the diversification of suppliers raises the complexity of interactions between them (Gereffi, Humphrey, and Sturgeon 2005). This complexity should be reduced by the development of technical and process standards within a BN (Grefen 2013). Indeed, the standardization of interactions between suppliers can increase the modularity of a BN (Sturgeon 2002). This modularity in a BN enables different suppliers to be linked and de-linked and can thus enhance the dynamic interactions between suppliers (Grefen et al. 2009; Rasouli et al. 2015b). In this way, it can be argued that service orientation within the supply chain dimension, which necessitates the provision of integrated products and services, leads to dynamic interactions between suppliers. This means that service orientation shifts the stable relationship between suppliers in a product-oriented supply chain, towards dynamic interactions between suppliers in an SBN, see Figure 3, the supplier–supplier interactions dimension.

The combination of both dimensions of service orientation within the interaction aspect of a BN can be reflected by the value network concept. In line with Lusch, Vargo, and Tanniru (2010), a value network can be described as modular suppliers that are loosely coupled and co-produce and co-create integrated solutions with customers. This situation extends interactions between customers and suppliers from demand chain activities (i.e. co-creation) to supply chain activities (i.e. co-production) as well. This means that highly activated customers are perceived as partners within the supply processes of a product or service in the role of co-innovators, co-designers, co-manufacturers and co-marketers (Romero and Molina 2011). This results in a situation that all actors – including suppliers and customers – interact together to 'create value for themselves and others through reciprocal resource integration and service provision' (Vargo and Lusch 2011).

3.3. Network governance aspect of service orientation in BNs

Governance of a BN refers to the adaption, coordination and safeguarding of interactions between collaborating parties (Jones, Hesterly, and Borgatti 1997). The adaption of interactions between actors is necessary due to environmental uncertainty, such as change in customers' requirements. Coordination addresses the asset specific exchanges between actors. In the context of BNs, the coordination can be described as the management of networked processes to

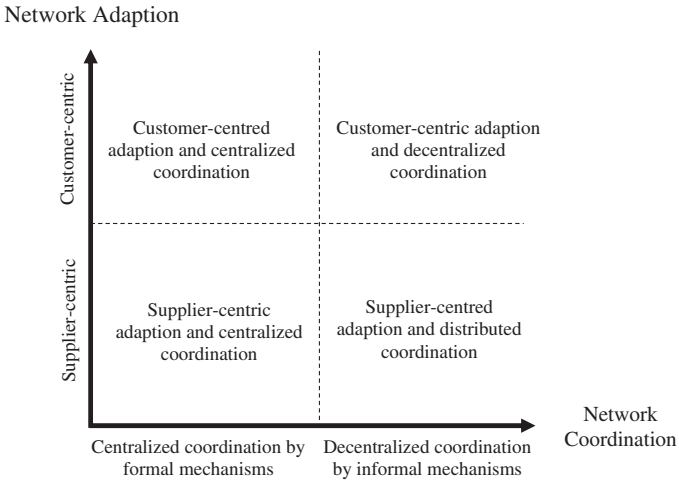

Figure 4. The characterization of the governance aspect in SBNs.

provide a product or a service to customers. Because actors within a BN share their assets together, safeguarding is necessary to prevent issues such as opportunism (Zaheer and Venkatraman 1995). According to Figures 2 and 3, it can be argued that because the demand chain dimension of service orientation focuses on aligning BN capabilities and customer expectations, it highlights the adaption issue within the network governance aspect. But, the supply chain dimension, which focuses on the interactions between suppliers, emphasizes the coordination issue in a BN, see Figure 4.

As discussed within Figures 2 and 3, service orientation in demand chain dimension refers to the shift from viewing value from a supplier's perspective (as value-in-exchange) towards viewing value from a customer's perspective (as value-in-use). This emphasis on the role of the customer as a creator of value in SBNs highlights the importance of the customer-centred adaption of a BN rather than supplier-centred adaption, see Figure 4, vertical axis. This shift from supplier-centric towards customer-centric adaption can be described by the difference between the internal and external legitimacy of a BN (Human and Provan 2000; Provan and Kenis 2007). The internal legitimacy that is supplier-centred endeavours to adopt a BN in a way that encourages suppliers to continue their participation within a BN. In contrast, the external legitimacy is customer-centred and tries to adopt a BN in a way that enhances the viability of customer interactions.

The supply chain dimension of the network governance aspect emphasizes the coordination between suppliers collaborating to provide integrated products and services. Providing single products or services through stables interactions can be conducted through predefined processes (Eshuis and Grefen, 2008). A centralized coordination approach is more suitable for pre-defined stable inter-organizational operations because this approach can decrease the complexity of the operational platform that supports the realization of networked interactions (Christopher 2000; Gereffi, Humphrey, and Sturgeon 2005; Provan and Kenis 2007). However, provision of integrated products and services requires additional collaborating partners as well as dynamic interactions among them (see Figure 3).

Regarding the dynamic interactions between parties to provide a more complete package of products and services (see Figure 3), a decentralized structure of coordination can be better fit with this type of BNs (Andersen and Christensen 2005), see Figure 4, horizontal axis. The aim of the decentralized coordination in this type of BNs is to share mutual knowledge in order to innovate and develop new products and services. In such contexts, interactions between parties do not have to be governed by formal mechanisms (Macaulay 1963). Instead, participation, communication and trust are the key informal mechanisms that can be used more effectively (Joshi and Stump 2009).

The two dimensions of network governance in SBNs imply that an SBN that is adapted based on a customer experience can be coordinated in a centralized or a decentralized structure. A centralized coordination in customer-centred adapted SBNs describes a structure in which a specified actor who is responsible for customers' experience, centrally orchestrates all resources provided by collaborating parties to fulfil expected customers' experiences. A decentralized coordination of customer-centred SBNs refers to a structure that all collaborating parties are able to choreograph resources provided by collaborating parties in order to fulfil expectations of customers who interact with them (see Grefen and Dijkman (2013) for more details). The combination of both dimensions of service orientation within the network governance aspect reflects a situation where customers are active actors within a value network and choreograph services offered by other actors (including suppliers and customers) to shape the best experience for them. In other words, regarding actor-to-actor interactions between parties within a value network (see Figure 3), all actors can be seen as a choreographer who each try to create the best experience for themselves.

4. Approach for the evaluation of the developed integrated framework

According to the purpose of the development of the integrated framework, we concentrate on the evaluation of its applicability and usefulness in real-world situations. The integrated framework developed in Section 3 can be used by strategic decision makers and BN engineers who are responsible to develop network strategies as well as innovative networked business models. Therefore, we evaluate how the integrated framework can be applied by these target groups (i.e. the applicability of the developed artefact). We also investigate if the developed framework provides useful insights for decision makers who are responsible for directing service orientation transitions in BNs (i.e. the usefulness of the developed artefact). More precisely, the evaluation of the usefulness of the developed integrated framework addresses these three purposes:

- provide a comprehensive insight for decision makers to analyze real-life BNs from service orientation point of view,
- investigate service orientation transitions in real-life BNs,

- enhance alignment between different aspects of service orientation in BNs through a coherent description of inter-related aspects.

Regarding the nature of the artefact (i.e. the developed integrated framework) that is going to be evaluated, naturalistic evaluation methods can be more appropriate (see Venable, Pries-Heje, and Baskerville (2012) for more details). The reason is that the developed integrated framework reflects the characteristics of SBNs that need to be used by business strategists and business model developers in real-life BNs. Indeed, the developed integrated framework needs to be evaluated on the basis of empirical evidence gathered by the involvement of target groups of people, to investigate the applicability and usefulness of the artefact for them.

Among naturalistic evaluation methods, a case study approach, which supports a significant consideration of the context of the research (i.e. business networking), is the most appropriate approach. The case study research approach enables us to investigate the applicability and usefulness of the developed framework for directing service orientation in real-life BNs. In this way, this approach makes it possible to discuss how decision makers in real-life BNs can apply the developed framework to characterize their service orientation transition and think comprehensively and coherently on different aspects of service orientation to achieve alignment during their service orientation transitions. This approach makes it possible for us to investigate how the developed framework can enhance targeted practical audiences to make better decisions and engineer more appropriate business models.

The most important drawback of this approach is the difficulty for the generalization of the findings from cases. To deal with this difficulty, we use replication logic that can enhance the generalizability of the findings (Yin 2013). We also rely on an analytical generalization that is supported by underlying relevant theories. The design of the case study for the evaluation of the applicability and usefulness of the developed integrated framework is described in the next sub-sections.

4.1. Designing the case study research

We use a multiple-case design for the evaluation of the developed integrated framework. The replication logic in the conducted multiple case study enhances the generalizability of the findings. In order to investigate the different possible service orientation transitions by using the developed integrated framework, we need to select cases in a way that they cover possible service orientation transitions. Based on the developed integrated framework, three main service orientation transitions can be considered in a BN, respectively:

- service orientation on the vertical dimension (i.e. the strategic focus is on value co-creation),
- service orientation on the horizontal dimension (i.e. the strategic focus is on the integration of products and services),
- service orientation in both dimensions (i.e. the strategic focus is on co-creation of integrated solutions).

As the developed framework has a coherent view on the three inter-related aspects, these three directions that have been described on the basis of the value aspect, implicitly address service orientation transitions within the other aspects. More precisely, the first direction points out an SBN that co-creates customer-centric products and services through handling relational customer–supplier interactions that are adapted by customers. The second direction addresses an SBN that proposes integrated products and services through handling dynamic networked interactions that are coordinated in decentralized structures. The third direction indicates an SBN that co-creates integrated solution with customers through handling actor to actor interactions that are adapted customer centric within distributed coordination structures. In line with these three main directions for service orientation, we selected the three BNs. This means that each of the selected BNs has focused on a certain direction to be service oriented. For the selection of the relevant cases, we conducted a preliminary analysis in the five BNs in the Netherlands. These cases were selected due to the access to their strategic documents, which enabled us to investigate their relevance to our research. This preliminary analysis was based on relevant documents about the strategic plan of each of these BNs. Among these five BNs, regarding the aforementioned criteria, we selected the three BNs (that we refer by A, B, and C), see Table 1. Two other cases had a same service orientation direction as case A and B. Among these selected cases, the case A is focused on service orientation within the value-co-creation dimension, the case B is focused on service orientation within the integrated products and services fulfilment dimension and the case C aims to be service oriented in the both dimensions. These directions of service orientation for each of the selected BNs are elaborated further in the next section. The selected three cases cover the main service orientation transitions that can be considered regarding the developed framework.

4.2. Collecting case study evidence

In this research, we gathered data from different sources (parties) positioned within each of the selected BNs

Table 1. Selected BNs to conduct multiple case study research.

Selected BN	Domain	Service orientation direction
A	Quality assurance	Customization of certification schemas regarding the customer requirements
B	Document management	Integration of related products and services to provide a complete package
C	Financial service (car-leasing)	Co-creation of integrated mobility solution

(multiple cases). To do so, we established a case study team of nine members to conduct gathering data from the selected BNs. We developed a set of procedures and rules to be followed to counter the issue of inconsistency within information gathering and to support the reliability of research. The key rules used were:

- All interviewers should have a consistent interpretation about the notions that are used in the developed integrated framework. To ensure this, all interviewers are involved in a joint discussion and shared their understanding of the developed integrated framework. In this way, inconsistent interpretations are recognized and a reference interpretation is shared among all interviewers.
- Interviewees should also have a consistent interpretation of the notions used in the integrated framework. For this purpose, a brief presentation is prepared to clarify the definitions of the used notions. After the presentation, interviewees are asked to describe their interpretation about the notions that are used. Then, any inconsistent interpretations are recognized and aligned. This rule supports the construct validity of the case study (Yin 2013).

These rules provided a well-established basis for the construct validity of the case study (Flyvbjerg 2006). On the basis of the case study protocol, we used in-depth interviews (Rubin and Rubin 2011) and relevant documents as sources of evidences. The in-depth interviews provided a well-established basis to explore how different organizations within the selected BNs collaborate together to provide products or services to their customers. From the in-depth interviews, we also investigated how the selected BNs have been organized and governed to provide service-oriented value. The in-depth interviews were supported by a pre-defined semi-structured questionnaire that covers the line of inquiry, please see Appendix A1. This questionnaire consists of six parts each of which concentrates on a certain dimension of service orientation within each aspect of the integrated framework. To investigate service-orientation within each of these six parts, we developed three or four questions. Each of these questions addresses a key relevant characteristic and aims to investigate the extent to which this characteristic has been realized in the BNs. Although the semi-structured questionnaire that was used for three cases was the same, in order to support the understandability of questions, we customized it through some examples relating to the context of each of cases. Regarding the aim of this case study research, we gathered data about the current and the planned future situation of the BNs from service orientation point of view. We selected interviewees among employees who are responsible for strategy development, business model innovation, enterprise architecture, or business process management within these BNs. According to the purpose of the developed framework, these people were the main target groups that can apply and use the framework in order to develop networked strategies and business models within service orientation transitions. We conducted 26 in-depth interviews that include respectively, 8 interviews within case A, 7 interviews within case B and 11interviews within case C.

Because the cases in our research were BNs, through the in-depth interviews our focus was on the exploration of networked interactions between responding organizations and other parties within the BN. To ensure the internal validity of evidences relating to the BNs, we triangulated evidences gathered from different parties. For this purpose, we asked the questions from different parties to ensure that all parties have a reliable thought about the networked interactions within the BNs. To avoid biased evidences, the in-depth interviews in organizations that collaborate within the BNs were conducted independently. This means that interviewers avoided from describing about thoughts of other relating parties during the interview.

4.3. Analyzing case study evidences

To analyze the gathered information to evaluate the applicability and usefulness of the developed framework, we conduct three steps.

In the first step, each of the selected BNs is described based on the information gathered. This description includes the identification of final customers of the BNs, products/services offered by the BNs, networked interactions between the parties and the way that the BN is governed. To ensure the validity of our description on the investigated BNs, we present our description on the BNs for the relating interviewees. Because visualization enhances the representation of the interactions within a BN, we use the Business Process Management Notation (BPMN) conversation diagrams (Allweyer 2010). These diagrams provide a standard notation to represent networked interactions among collaborating parties in a BN.

In the second step, we apply the developed integrated framework to characterize service orientation within each of the elaborated BNs. For this purpose, we rely on the evidences gathered by using the developed semi-structured questionnaire during in-depth interviews. For the investigation of service orientation within each dimension of the three aspects, we develop three or four relevant questions. Each of these questions addresses a certain service orientation characteristic. This characterization results in the (qualitative) positioning of the current and future state of the cases within the developed integrated framework. If this positioning is agreed by interviewees, we can conclude that the developed integrated framework can be applied in real-life situations for the characterization of service orientation.

In the third step, we investigate how the characterization of service orientation, by using the developed integrated framework, enables decision makers in these BNs to refine their service orientation plan (i.e. the usefulness of the developed integrated framework). To do so, we discuss about the current and future position of each of the BNs as well as their service orientation transition plan. Based on this discussion, we investigate how the developed integrated framework enables strategic decision makers in real-life situations to refine their service orientation transitions. In addition, in

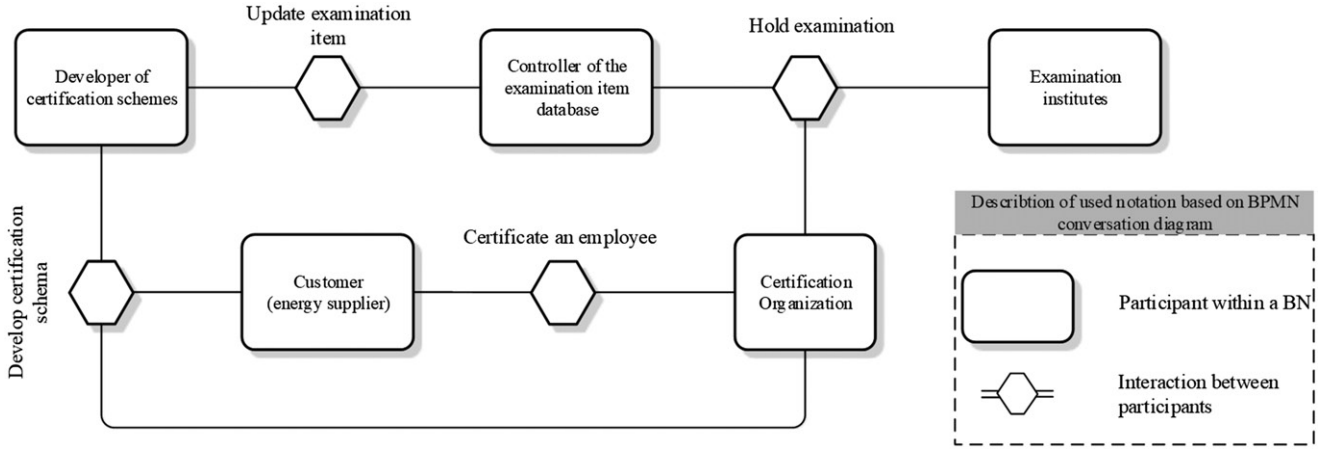

Figure 5. The BPMN scheme of Case A; parties and interrelations.

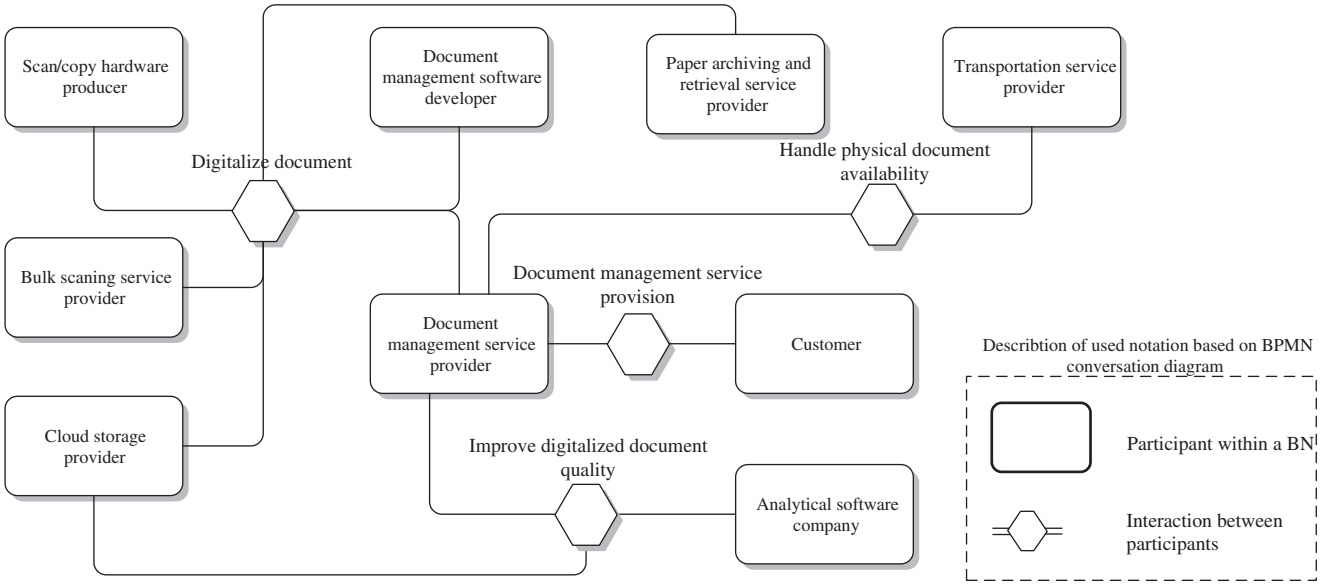

Figure 6. The BPMN scheme of Case B; parties and interrelations.

order to evaluate the usefulness of the developed framework to align service orientation from different relevant aspects, we discuss about the consistency of the service orientation within the networked interactions and governance aspects with the characteristics of the value that is proposed by the BNs.

5. Case study research findings

According to the described steps to analyze the gathered evidences, we represent the results of the case study as follows.

5.1. Description of the selected BNs

Case A addresses a BN in a quality assurance domain. Parties collaborating within this BN provide a certification service in order to assure the safety of employees that work for energy suppliers in the Netherlands. The customers of this BN are energy suppliers, and it is organized by the certification organizations. This BN includes five types of parties, respectively certification organizations (i.e. the certification bodies), a developer of the certification schemes, an organization controlling and maintaining the examination item database, parties for holding exams (i.e. the examination institutes) and energy suppliers. The interactions between parties within this case are shown in Figure 5.

Case B is a BN that provides document management services for companies who deal with large volumes of invoices. This BN is organized by a document management service provider that is a strategic business unit of a big scan/copy device manufacturer. The parties within this BN and the interactions between them are represented in Figure 6. This BN aims to integrate different products and services to offer an integrated package of the document management services to its customers.

The case C addresses a BN in financial services domain. This BN is organized by a car-leasing organization. Other parties that participate in this BN are car dealers, car rental organizations, maintainers, fuel service providers, car insurers and public transportation card providers, see Figure 7. This BN currently provides cars for its customers. Customers of

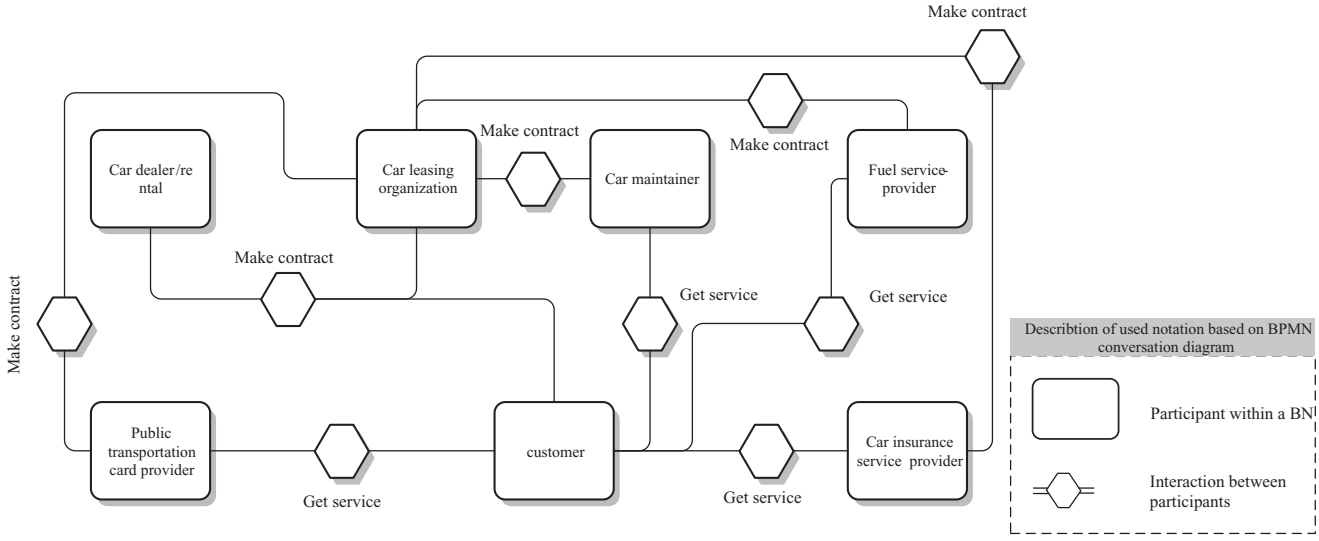

Figure 7. The BPMN scheme of Case C; parties and interrelations.

Table 2. The characterization of service orientation in the current state of the three BNs.

	Value aspect		Networked interactions aspect		Network governance aspect	
	Value creation	Value production	Supplier–customer	Supplier–supplier	Network adaption	Network coordination
Case A	Co-developed certification schemes	Risks of employees' unsafe behaviours are undertaken by energy suppliers	Energy suppliers interact actively with the certification schema developer	Stable networked interactions	Adapting the certification schemas is based on energy suppliers' requirements	Centrally coordinated by the certification schema developers and the certification organizations
Case B	Semi-uniformed document management services	An integrated package of products and services relating to document management	Transactional interaction based on steady contracts	Stable collaborations within semi-fixed networked business processes	Scan/copy technology centred adaption	Central coordination by the document management service provider
Case C	Product-oriented car lease	Risks of usage of car are handled by customers	CRM does not support customer-centric value propositions	Stable partnership	Lease rate centred adaption	Central coordination by the car lease organization

this BN are companies that need transportation facilities. The car-leasing organization as the organizer of this BN has already planned to move towards the provision of an integrated mobility solution. The integrated mobility solution needs to be co-created by customers based on their personal expectations.

5.2. Characterization of the service orientation in the BNs by using the developed integrated framework

In this step, using the data gathered through in-depth interviews, we characterize service orientation in each of the described BNs using the developed integrated framework, see Table 2. For this purpose, we position the current and the planned situation of the BNs from a service orientation point of view. The service orientation transitions of the studied BNs are reflected in Figure 8. Service orientation in the investigated BNs is described further in this section.

5.2.1. Case A

Value creation: This BN provides a quality assurance service by certification of employees who work in the energy domain. The certification schema should support the requirements of energy suppliers from the safety point of view. So, this BN needs to develop different certification schemes that each focuses on a certain aspect of safety for a certain type of activities. A dedicated actor within this BN is responsible to develop these certification schemes through the collaboration with other actors, particularly with energy suppliers. Based on this fact, it can be said that services are co-developed in this BN (see Figure 8, Matrix a, the current position of case A within the value creation dimension).

This BN has planned to develop new certification schemes to respond to energy suppliers' needs (see future position). Energy suppliers require more specific certification schemes to cover safety aspects for certain jobs. However, due to limitations of formal accreditation boards (Dutch Counsel for Accreditation), this BN has to aggregate similar certification schemes. This aggregation of certification schemes limits the possibilities for more customized certification schemes.

Value production: During a certification period of 3 years, certification holders need to keep track of any safety problems, faults and risks. However, the responsibility for extra training and examination is undertaken by energy suppliers as customers of this BN. In this way, this BN is not directly responsible for providing added services during the certification life-cycle. In addition, the certificate holders are

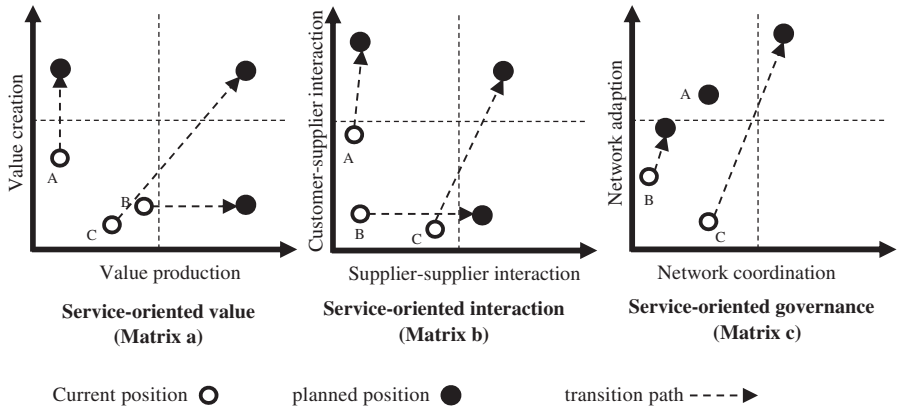

Figure 8. Positioning of the studied BNs from the service orientation point of view within the developed integrated framework.

employed by an energy supplier and all risks related to unsafe behaviour of a certification holder are borne by energy suppliers. Therefore, it can be concluded that this BN is focused on a single service and has currently no plans to extend this service from the life-cycle or risk point of view.

Supplier-customer interactions: Energy suppliers as customers of this BN interact actively in the development of the certification schemes. However, the interaction during other steps of the certification processes (e.g. planning and examination) is limited. The certification organizations and the examination institutes aim to involve the energy suppliers in scheduling and delivering the examinations.

Supplier–supplier interactions: Due to the established links between parties within this BN, they prefer to work together and so interactions are quite stable. There is no plan to expand this BN by adding new parties.

Network adaption: The adaption of the certification schemes is heavily based on energy suppliers' requirements. Energy suppliers do not have a considerable role in the scheduling and holding of the exams. However, the certification organizations together with the examination institutes plan to involve the HR department of energy suppliers in the scheduling of the examinations.

Network coordination: The coordination role within this BN is shared between the certification scheme developers and the certification organizations. The former coordinates parties for the development or improvement of the certification schemes; the latter coordinates parties during the examination activities. This BN has currently no plans to change this coordination structure.

5.2.2. Case B

Value creation: This BN provides semi-uniformed document management services for customers from different domains. This means that this BN does not consider the specific characterization of documents in each domain. Although different customers ask this BN to manage different types of documents, the process of document management is approximately the same. The customization, in this case, is limited to some technical adjustments. Therefore, this BN is not focused on the co-creation of value and majority of what it delivers is pre-defined and uniformed services. This BN also has no plan to focus specifically on customer requirements because decision-makers believe that the established uniformed service can respond effectively to the requirements of many customers.

Value production: This BN is orchestrated by the document management service provider in order to fulfil integrated products and services for customers. The semi-uniformed integrated products and services for document management is interesting for many companies with a large amount of document circulations because it reduces the risk of scan/copy device failure, missing and confounding documents, delay in document delivery and avoids investment on storage. This BN is planned to enrich its package of integrated products and services by adding new services such as data analytical tools. Based on this plan, this BN intends to provide an information (i.e. the content of the document) management service rather than a document management service.

Supplier–customer interactions: Regarding the nature of the value proposed by this BN for customers, the interaction with customers is transactional. Customers pay per document based on predefined contracts. This BN does not aim to change this type of interaction with customers, at least for the next 5 years.

Supplier–supplier interactions: Parties within this BN have a long-term collaboration with each other and interactions between them are stable and highly standardized. However, there is a plan to interact with different providers of data analytics tools. The reason is that each of these analytics tools is better suited to a certain context. Because customers of this BN are from different contexts, they need to select analytics tools providers dynamically.

Network adaption: Because offering semi-uniformed services is based on formal and pre-defined contracts, customers do not have many possibilities to adapt the BN. The BN is adapted by new scan/copy technologies. However, the shift towards offering information management service necessitates deeper IS integration between this BN and customers.

Network coordination: This BN is coordinated centrally by a document management service provider. Because of the stable and highly standardized interactions between parties, this coordination is achieved by formal contracts. However, the change in the nature of the proposed value and the

interactions (as described) can highlight the important role of data analytics tools providers in the BN coordination.

5.2.3. Case C

Value creation: This BN proposes an asset-oriented value (i.e. the car) for customers. The provision of this asset-oriented value is based on predefined contracts between customers and the car-leasing organization. Due to the rigidity of this contractual relationship, there is a limited possibility for customers to adjust the provided cars during a leasing contract. However, this BN plans to provide mobility solutions rather than cars. The provision of the mobility solution enables customers to arrange the best transportation experience for their requirements.

Value production: The car-leasing organization organizes some relevant services that are required by customers during the usage of a car, like maintenance, fuel card, and tire change services. However, customers need to arrange these services personally and pay for each of these services separately. The car is owned by customers during the leasing period and all risks associated with this ownership are their responsibility. The car-leasing organization intends to integrate these current value-added services as well as some new services to provide a complete package of mobility solution. In this way, customers will not need to arrange different services separately and the car-leasing organization will orchestrate all of required services.

Supplier–customer interactions: The car-leasing organization, which is the orchestrator of this BN, interacts with customers during car-leasing contracts period through a well-established CRM system. However, these interactions do not result in considerable adjustment of services during the usage of cars. Based on the plan to provide mobility solutions, the car-leasing organization aims to integrate its CRM and contract management systems. This integration enables the adjustment of the provided products and services during the usage phase based on customer feedbacks.

Supplier–supplier interactions: The car-leasing organization already has a stable partnership with car manufacturers and dealers. But, it interacts with different maintainers and insurance companies dynamically. For the provision of the mobility solution, the car-leasing organization aims to dynamically collaborate with car providers such as car rental organizations.

Network adaption: The adaption of this BN is often triggered by a change in leasing rates. Also offers by car dealers can result in the need to adopt the contracts with the customers. These adoptions are not necessarily in line with the customer requirements. For the realization of a new business model within this BN, for the provision of a mobility solution, the car-leasing organization plans to launch a customer agenda management system linked to the selling system. Based on this service, a customer can adapt the service provided by this BN actively.

Network coordination: The car-leasing organization and the car dealers coordinate the parties within this BN. However, coordinating parties who will participate in the provision of the mobility solution is challenging. The car-leasing organization aims to do the coordination centrally.

The results of the characterization of service orientation using the developed integrated framework are shown to interviewees again. The goal of this representation is to investigate if the developed integrated framework reflects the real situation of the cases from service orientation point of view. In all three cases, interviewees agreed regarding the characterization of service orientation within their BNs as described in this sub-section and shown in Figure 8. This means that the developed integrated framework is able to be applied properly for the characterization of service orientation in real-life situations. Based on our experience, the major difficulty in applying the developed integrated framework in real-life situations is identifying the boarders of BNs. This difficulty may arise because usually parties collaborate in different BNs. This difficulty can be addressed by specifying value that is proposed by collaborating parties. In this way, the investigation of the other aspects can concentrate on networked interactions and governance mechanisms that support the provision of the specified value.

5.3. Evaluation of the usefulness of the integrated framework

The previous sub-section indicates that the integrated framework can be applied to characterize service orientation in real-life BNs. However, this characterization should also provide new and well-structured insights for decision makers (i.e. the usefulness of the developed framework). Regarding the purposes of conducting the multiple case study, as described in Section 4, we investigate if the developed integrated framework provides a comprehensive insight into decision makers on service orientation in their BNs. In addition, we discuss how the developed integrated framework can align different decisions regarding the three aspects of service orientation in the BNs. For this purpose, we set two individual discussions for each of the case A and the case B and a group discussion in the form of a workshop for the case C.

The discussion about characterizing service orientation triggers decision makers in the case A to think deeply about the development of innovative business models that enables them to participate in handling risks relating to the certificated personnel that are employed by the energy suppliers. This innovative business model would be quite interesting for energy suppliers. However, the challenge of the realization of this business model is the necessity for the independence of certification related parties regarding the rules by the Dutch Council for Accreditation. An initial triggered idea is to add a new party to this BN that undertakes the HR management role, independent from the energy suppliers as well as certification parties.

Within the case B, using the represented characterization of service orientation, neglecting the co-creation possibilities within the current business model is questioned. Meanwhile, a strategic discussion is triggered by positioning the main competitors of this BN within the framework. We found out

that the main competitors mostly focused on the co-creation dimension of service orientation. This analytical insight enables decision makers to rethink their strategic direction. Also regarding the governance aspect, there is consensus that centrally coordination of this BN can limit the opportunities for the development of innovative analytics tools that are needed in the future business model.

The car-leasing organization within the case C has already developed a clear roadmap for service orientation to provide a mobility solution. The characterization of this roadmap using the developed integrated framework supports the participants in the workshop with new insights. This characterization clearly states that the developed roadmap requires two lines of activities to be conducted (i.e. co-creation activities and product-service transition activities). It also triggers a strategic discussion about the possibility of distinguishing between actors for the customer experience management and suppliers' coordination. Based on the resulting characterization, the best actor for adapting this BN is questioned. Although previously there was a consensus that this role will be filled by the car-leasing organization, through a deeper look at the required capabilities for this role, which is an access to customer experience during the usage of mobility solutions, it is conceived that a new actor (as a broker) is required to facilitate the exchange of information on the customer experience among different parties within this BN. This information broker should be able to integrate customer experience related information that is distributed among all parties.

The findings from the discussions on the characterization of service orientation in the investigated BNs, clearly states that the developed integrated framework enables decision-makers to have a comprehensive view on service orientation in the BNs. As described, this comprehensive view from different inter-related aspects supports in-depth refinement of service orientation transitions in the BNs. The coherence of the three aspects clearly highlights the need for the alignment between decisions in different functional units within the BNs. Indeed, the integrated framework helps the recognition of misaligned directions for service orientation in the BNs. For example, as described, the misalignment of service orientation transition within the value and networked interactions with the network governance aspect in the case B notifies decision makers that they need to concentrate on governance mechanisms that enable them for decentralized coordination of dynamic interactions that they will deal with in their future business model.

6. Discussion and conclusion

6.1. Discussion

The developed integrated framework provides a comprehensive and coherent view on service orientation in BNs. The comprehensiveness of the developed integrated framework addresses considering different service orientation theories from different relevant contexts that are described thoroughly in a structured way. In this way, this article extends the previous knowledge on co-creating integrated solutions by bridging theories on product service transitions (Cavalieri and Pezzotta, 2012; Gaiardelli, Martinez, and Cavalieri, 2015; Parida, Sjödin, Wincent, and Kohtamäki, 2014) as well as theories on managing value co-creation (Frow, Nenonen, Payne, and Storbacka, 2015; Jaakkola and Hakanen, 2013; Storbacka, Windahl, Nenonen, and Salonen, 2013). The article explains the mentioned theories in the context of BNs in a coherent way. The coherence of the developed framework refers to considering different inter-related aspects of business networking that supports the alignment between different decisions relating to service orientation in BNs. In this way, the article extends the previous work in the context of SBNs (Gummesson and Mele, 2010; Hakanen and Jaakkola, 2012; Nenonen and Storbacka, 2010) by providing a coherent view on the different aspects that should be considered during their design.

The developed integrated framework bridges between descriptive knowledge on service orientation and prescriptive models for designing and implementing SBNs. In this way, it eases applying service orientation theories during engineering real-life SBNs. But, it does not prescribe certain initiatives for service orientation. This means that the developed framework is not a prescriptive tool to be used by SBNs. Therefore, although this integrated framework cannot be seen as an SBN engineering tool, it can support an SBN engineering process by providing a comprehensive view on relating theories and aligning between different related aspects. Due to this nature of the developed integrated framework, which does not prescribe context-centric initiatives, it can be used in different industries and business contexts.

It provides a well-structured insight for decision makers in BNs to respond to the need for offering highly customized integrated solutions for customers. This well-structured insight enables decision makers to view different aspects of service orientation transition coherently. The developed integrated framework is a good basis for bringing together the service orientation concerns of practitioners in different functional business domains. Although people in the marketing domain have concerns about the value proposition and customer relationship management, people in the operations management domain worry about the issues like how to design and implement intra and inter-organizational business processes in an effective and efficient way. Senior BN executives are mostly concerned about the governance issues to maximize the value within the network, to share the risks and rewards between parties, and to protect BNs against different internal and external threats. Our integrated framework provides a basis that all the mentioned concerns can be considered coherently, in order to make well-established decisions regarding service orientation transitions. Meanwhile, because a BN includes different parties from different contexts with various terminologies, the developed integrated framework can also provide a well-defined terminology for decision makers.

The results of the case study clearly show the applicability and usefulness of the developed framework in real-life situations. The replication logic behind the conducted multiple-

case study, in which cases are selected from different industries, represents the applicability and usefulness of the developed integrated framework within other BNs. Meanwhile, the external validity of the findings from the conducted case study can be supported by analytical generalization of the findings (see Yin 2013). This means that as the development of the integrated framework is established on relevant theories in the context of service orientation, it can be applied in order to provide useful insight for decision makers on service orientation within other BNs.

6.2. Implications

The described three matrices together can be seen as an integrated framework that coherently characterizes different aspects of service orientation in BNs. The integration of the three developed matrices originates from the logical interrelationship between the investigated aspects based on the cybernetic system approach. More precisely, on the basis of logical reasoning supported by the relevant theories, service orientation transition within the three inter-related aspects should be aligned. This means that, for instance, the co-creation of a product or service cannot be possible without relational interactions with customers that are governed through a customer-centric network adaption. The proposed integrated framework provides a well-established basis for investigation of the alignment between different aspects within service orientation transitions. In this way, it can bridge between descriptive knowledge in the context of marketing and operations management and prescriptive knowledge in BN engineering context. The developed integrated framework can direct applying prescriptive business modelling tools (e.g. Lüftenegger, Comuzzi, and Grefen 2013; Lüftenegger, Grefen, and Weisleder 2012), networked business process management approaches (e.g. Mehandjiev and Grefen 2010) and network governance engineering frameworks (e.g. see Dietz et al. 2005). This direction ensures that service orientation transition in a BN is consistent from different relevant aspects.

Each position within the developed integrated framework addresses a certain value and risk for BNs. Although service orientation within each of the two described dimensions is strongly needed to achieve competitive advantage in globalized markets, it results in emerging risks for BNs. These risks can be the consequences of different characteristics of SBNs. For example, dynamic interactions between parties within a BN can cause information quality problems such as information insecurity and syntactic and semantic interoperability problems (Rasouli, Eshuis, et al. 2015; Rasouli et al. 2016); or using the customer experience for new product/service production (i.e. co-production) can result in privacy issues. Because of these emerging issues, decision-makers need to make trade-offs between market forces to be more service-oriented and risks resulting from this service orientation (Alghisi and Saccani 2015). As service orientation strongly highlights the formation of information-intensive interactions, many of the mentioned risks are related to the information assets within a BN. This highlights the need for further development of theories regarding information and IT governance in dynamic service-oriented collaborations (Rasouli et al. 2015a, 2016).

Regarding the conducted case studies, it can be induced that because service orientation is mostly led by marketing departments, the main focus is usually on the value aspect and other aspects of this transition are neglected. The lack of a comprehensive view on different aspects of service orientation causes the accumulation of new product or service ideas that are not supported by relevant mechanisms to be realized. Dealing with this misalignment between market-driven business ideas and IT-enabled supportive mechanisms is more complicated in SBNs because of the distribution of governance decisions among parties. This misalignment can easily interrupt the service orientation transition in a BN. So, the first priority within a service orientation transition roadmap in a BN must be the development of the well-established network governance including structural, procedural, and relational mechanisms.

6.3. Conclusion

In this article, an integrated framework is developed and empirically evaluated that comprehensively and coherently characterizes service orientation in BNs. The developed framework brings together different service orientation related theories in the context of BNs in a structured way. In this way, it bridges between descriptive knowledge on service orientation and prescriptive tools for engineering SBNs. The conducted multiple-case study clearly represents the applicability and usefulness of the developed integrated framework for characterizing service orientation in real-life BNs. However, using the developed integrated framework as a prescriptive tool in real-life BNs requires more empirical research for the investigation of the inter-relationships among decisions within different aspects.

Although theoretical argumentation sufficiently supports the corresponding inter-relationship among service orientation directions within different aspects, more empirical validation is required to enhance the findings from the case study based approach in this article. In addition, although the generalizability of the applicability and usefulness of the developed integrated framework is sufficiently supported by the replication logic behind the conducted multiple case studies as well as relevant theories used within its development, applying it in more diversified BNs can enhance the confidence of the findings. Meanwhile, although the direction of decisions on service orientation through the developed integrated framework is discussed, as in the investigated BNs decisions on service orientation are not systematically made and documented by using concrete tools – e.g. collaborative products and service architectural tools or networked interactions engineering models – the ability of the developed integrated framework for directing concrete service orientation related decisions needs to be investigated in future works.

Although the integrated framework developed, in this article, provides a well-established basis to align different decisions within a service orientation transition, the alignment of

strategic, tactical, and operational decisions within demand chin and supply chain dimensions from the three different aspects introduced, in this article, require more concrete tools that need to be addressed in future research. The development of concrete measures and scales to facilitate positioning BNs within the developed framework and enhance concrete relating decisions can be a good direction for future research. Meanwhile, the development of SBN engineering tools that supports designing and implementing service orientation in different dimensions regarding the developed integrated framework can be considered as another relevant research direction in future works. In addition, the extension of the developed framework by adding other relevant dimensions and notions, like the distinction between functional or innovative nature of value proposed by a BN, can enhance the applicability of the framework to develop business networking strategies. Also, the development of approaches to align corporate governance structures of collaborating parties with a network governance structure is seen as a relevant direction to support forming SBNs.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix A1. The semi-structured questionnaire scheme supporting the in-depth interviews for the evaluation of the developed integrated framework for characterization of SBNs

A1. A brief introduction (around 10 minutes)

As a first part of the interview meeting, the developed integrated framework and core concepts are represented by the interviewer. Based on that, the structure of the questions during the interview is elaborated for the interviewee. This enhances him/her to follow the line of the query during the interview meeting.

A2. General questions about the BN

- Who are the final customers of your business?
- What do you offer for these customers?
- Who are the main actors (including key suppliers in up-stream and down-stream supply chain) that together form the BN that you participate in?

3.. Questions about service orientation in the BN

A3.1. The demand chain perspective on service-oriented value

- What are the customizable characteristics of products/services that are offered by the BN?
- How do you improve the value for the customer during the usage of the product/service? Do you have several meetings for example with the customer about value improvement? What is your structure for doing this?
- Two extreme points are described within the value co-creation spectrum. One BN focuses on mass-customized value propositions based on the unique expectations of a customer. Another BN offers standard value propositions based on general customer requirement analysis. Where your BN can be positioned within this spectrum and how will this change in the future?

A3.2. The supply chain perspective on the service-oriented value

- What are the current product/services within whole product/service lifecycle (e.g. after sale service)? What are new product/service development projects to enrich this lifecycle?
- Regarding the servitization spectrum, does this BN offer physical products (i.e. product-oriented) or the functionality of products (i.e. result-oriented)? For instance, does a customer pay for a product or pay per use of product?
- How are the risks of product/service usage within whole lifecycle distributed among suppliers and customers? For instance, if the risk of failure of a physical product is undertaken by suppliers, or by customers, or is shared?

A3.3. The demand chain perspective on the service-oriented interaction

- How are customers involved in the process of the development of new products/services? How will this change in the future?
- Two extreme situations are described. A BN has only transactional interactions with customers, where the BN advertises its product/service and the customer decides to buy it or not. In the other situation, the customers are active and are in dialogue with suppliers in the BN to create value for themselves. Where is this BN now and in the future?

A3.4. The supply chain perspective on the service-oriented interaction

- The BN already has a set of parties that participating together. How is this BN enriched by adding new parties to provide new products/services? Is there, for instance, a predefined process in this BN for discovering new parties that can offer new relevant products/services?
- How are the collaboration mechanisms defined in this BN to support collaborative new product/service development?
- Is the relationship between parties within this BN is stable or the parties and the relationship between them change continuously to support new offers for customers?

A3.5. The demand chain perspective on the service-oriented governance

- How is customer experience relating to the offered products/services by this BN gathered and analyzed?
- How is the CRM analytics linked with new product/service development process in this BN?
- Is the logic behind the new product/service development in this BN is technology-oriented or customer-oriented?

A3.6. The supply chain perspective on the service-oriented governance

- How are supply chain activities (e.g. transportation, production, and inventory management) coordinated among parties in this BN?
- Is there a central coordinator in this BN or it is shared between different parties?
- Is the relationship between parties is formal and based on the predefined rigid contracts or it is informal and based on relational mechanisms (e.g. trust)?